Enhancing the "Cooperativa de Acueductos de Patillas"

- Partnership for Addresing Multimedia Environmental Risks in Poor Rural Communities in Puerto Rico

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Understanding the steps of the CARE Roadmap

- *Expectations*
  - Strengthen leadership skills
  - Community Collaboration
  - Environmental Justice

Modelo Cooperativo para Resolver *Conflicto* y mejorar la *Salud* de la Comunidad

- **CARE** – ***COMMUNITY ACTION FOR A RENEWABLE ENVIRONMENT***
  ACCION COMUNAL PARA UN AMBIENTE RENOVADO
- ***BUILD AND REBUILD PARTNERSHIPS (Step 1)***
  - ***Determine Community Capacity***
  - ***Define the Characteristics of the Community***
  - ***Assemble a community-based Environmental Health Assessment Team***

Dificultades: comunicacion de riesgos y las prioridades sociales

- Las sociedades responden a información sobre riesgos ambientales en la misma forma que los individuos.

- Utilizan los mismos mecanismos de defensa psicológicos que se utilizan para resolver otros conflictos de la vida contidiana.

  – ("Understanding the responses to environmental risk information", Joanne Vinning in *Biohazards of drinking water treatment*, Lewis Publishers, 1989)

Desarrollo e implantación de las reglamentaciones:

- Los individuos deciden las prioridades colectivas de la sociedad en que viven .

- Las leyes y reglamentos adoptadas por un pueblo reflejan las metas y prioridades colectivas.

BUILD AND REBUILD PARTNERSHIPS (Step 1)

- ***Determine Community Capacity***
- ***Define and Characterize the Community***

BUILD AND REBUILD PARTNERSHIPS (Step 1)

¿Porqué el modelo colaborativo?

- Cooperar – ayudar, unir la acción propia a otras para producir cierto resultado; aportar; colocar nuestro granito de arena

- ***Task 3- Assemble a community-based Environmental Health Assessment Team***

Step 2 – Identify Community Concerns
Step 3 – Identify Community Vulnerabilities

- **Task 4- Define the Goals, Objectives and Scope of Assessment**

Step 3 – Identify Community Assest

- **Task 5 – Generate a List of Community-Specific Environmental Health Threats *(with the community)***

Project Goals: US EPA and CECIA-IAUPR

Interest

- ***Help the communities understanding the deficiencies that make them not comply with the SDWA.*** *(Corregir las deficiencias del sistema que hacen que viole la Ley y que sirvan agua no segura para bebe).*

- ***Help the communities to make the link between illness and lack of compliance.*** *(Ayudar a la comunidad a entender la relación entre enfermedades y el incumplimiento con la reglamentación)*

- ***With the participation of the members of the community and the partners, correct minor deficiencies and make a plan for other more complicated corrections.*** *(Con la participación ciudadana y la orientación de la US EPA y de CECIA, corregir las deficiencias que hacen que el sistema esté en incumplimiento con la Ley.)*

Project Goals: US EPA and CECIA-IAUPR

Interest

Interés de la EPA & CECIA IAUPR

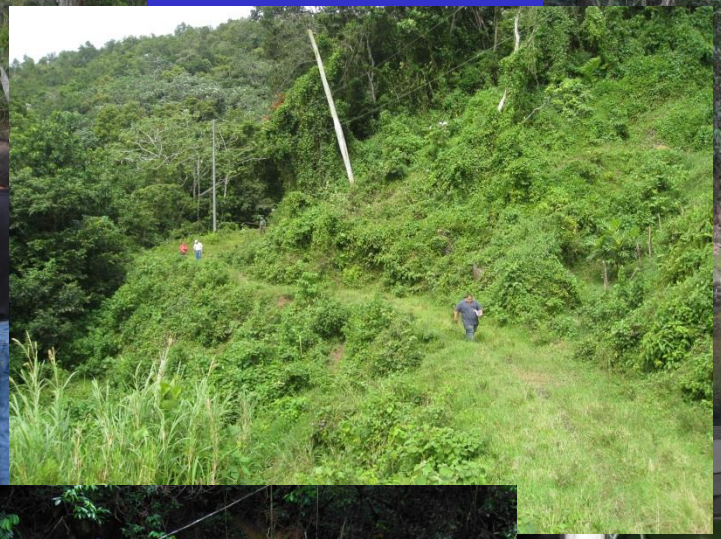
- ***Reduce conflict among community members with the goal of proper operation and administration of the systems.***
  - *Offer orientation and assistance*
  - *Mediate*

- *(Proveer asistencia y orientación por un período de dos años para que la comunidad se integre a la operación del sistema)*
- *(Actuar de mediador)*

Step 5 – Identify Concerns for Immeadiate Action

- TOOLS
  - ***Activate the IWG for Small Systems created under the EJ framework of the Demostration Project*** (Activar un comite de agencias con representantes de la comunidad para ayudar a las comunidades)
  - GIS mapping of communities
  - Create a workplan with the communities
  - Meet every month to adjust the plan and tasks to the achievements

How did we do it????
All at once



Meetings, meetings and more meetings

Three (3) types of community gatherings and meetings were scheduled:

- general assemblies: at least 8 general assemblies were coordinated.
- CAP board meetings: at least 20 board meetings
- Risks-decision meetings: at least another 8 meetings were celebrated to discuss the ways in which the risk communication and risks prioritization were to be done.
  - At least 4 meetings were celebrated to decide on the main priority.

What made **the priorization of the top risks** an easy task

- **Bringing the communities to field:** One 40 hour formal GIS course was held where 11 community members participated (3 student mentors from the area were trained on how to teach GIS mapping and the rest were the community volunteers).
- **Other educational activities:**
  - The course had 20 hours of theoretical and 20 hours of field information collection. With this, maps were constructed for the communities. This translated to 221 man-hours of people interacting with the community at large to talk about community
  - One 20 hour course was offered about how to design practical educational activities to demonstrate how contamination travels through the environment.
  - One 150 hour course is being held where 12 members of the community and 3 CECIA participants are learning how to operate water systems and how the operation and management of the systems protects against contaminants in the water.
  - Two field workshops were performed to develop capacity in the community members to understand sampling as a barrier for their protection against risks. In these heavy metals in soil and water were sampled and determined in 8 of the sectors.
  - Three workshops were conducted about how to develop a billing program for the CAP and the other communities.

Decisions, Decisions, Decisions

Risks were ranked and the order and priorities for action were designed to deal with the selected risks:

- Cost of energy for the sustainable operation of wells.
- Economic sustainability of the treatment and operation.
- Lack of appropriate technology (treatment infrastructure) to eliminate contaminants
  - Filtration for parasites and UV disinfection.
  - More reliable treatment for compromised surface sources
  - Improvements of the wells

¡El agua es gratis!

Mostly they agreed with the fact that Water is free!

Cuál es la diferencia entre estos niños y los de la comunidad en terminos de riesgos de salud?

- **Ninguna, sino se trata el agua…**

Their kids' water is no different than in the third world if they don't get involved…

¡El agua es gratis!

- **Si usted va a donde está y la usa allí, lavese, bañese y beba de un riachuelo**

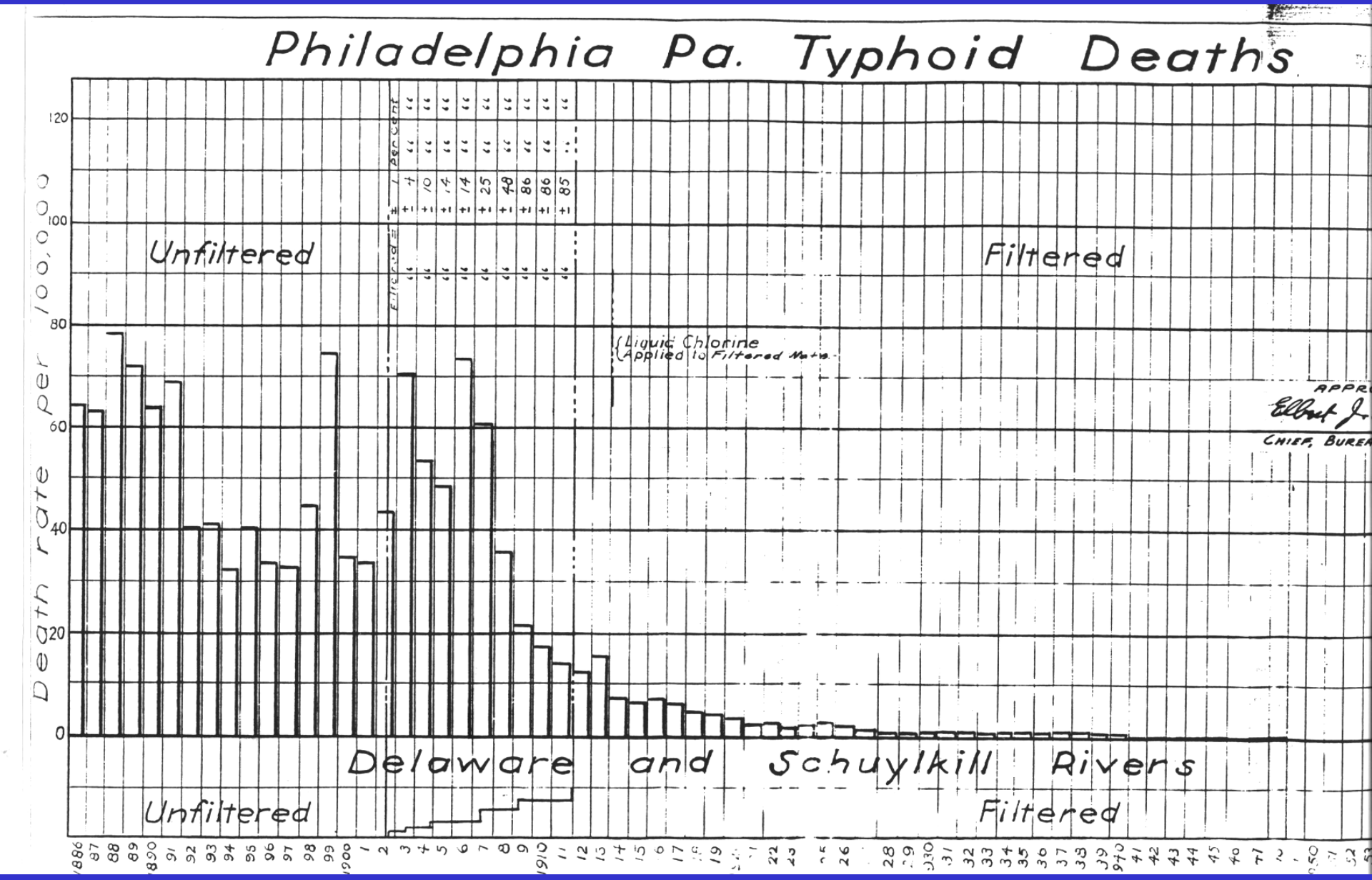
¡El agua es gratis!

- **Si usted atrapa lluvia y la guarda**

¡ La enfermedad es gratis , también!

- Leptospirosis, enfermedad diarreica, Hepatitis E, cólera, Malaria, Tifoidea, Salmonellosis, Shigellosis, Conjunctivitis……..
- Las infecciones de piel, ojo, oreja, naríz, garganta, pulmón, intestinos……
- Cancer – del estómago……

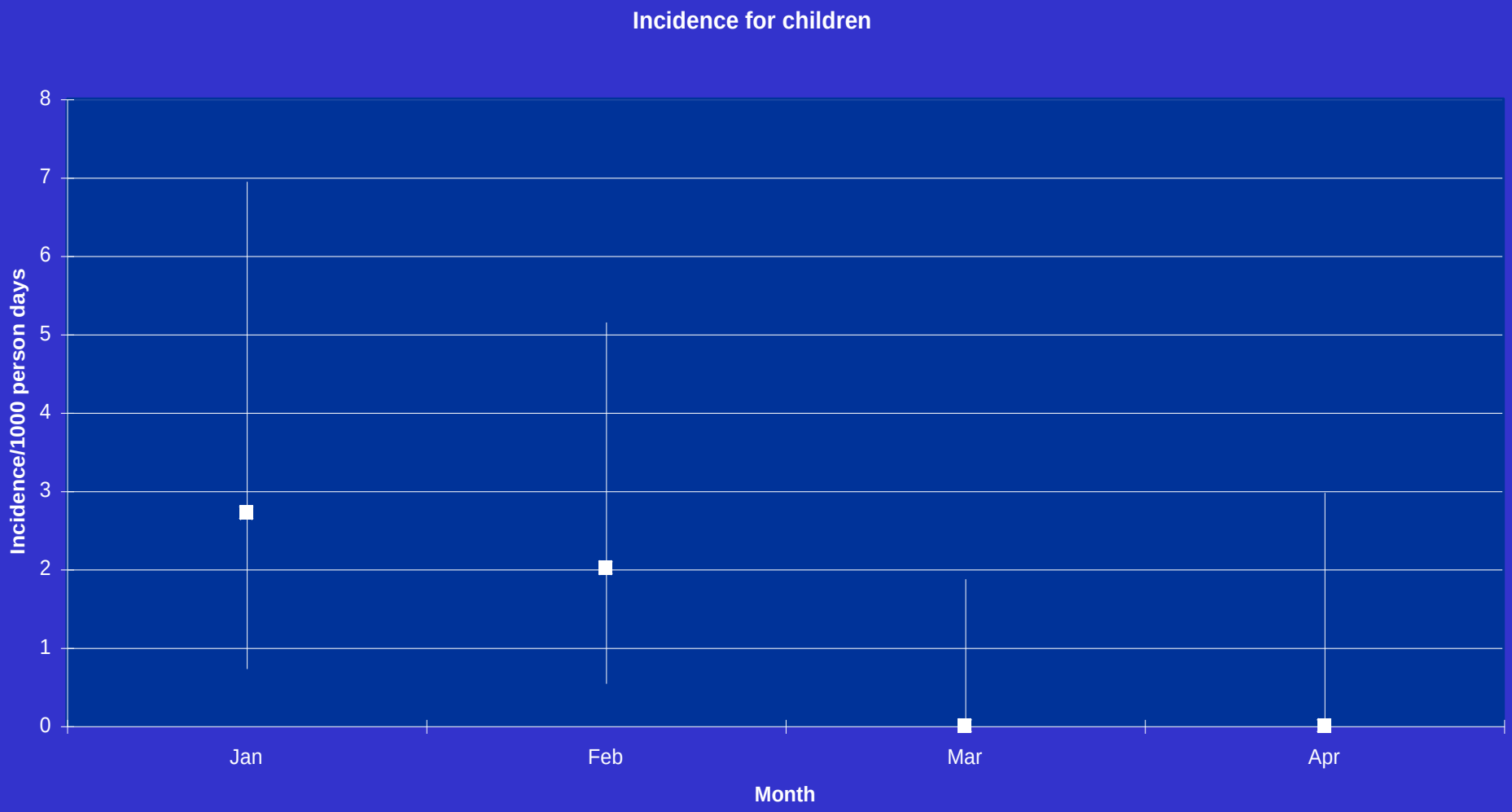
¡ La enfermedad es gratis , también!



Health Studies

- **Student Operator Involvement in Systems Reduced Incidence of Diarrheal Disease**
  - Reduction in diarrhea was significant after intervention; stronger in children and elders

(Fishers exact test p=0.002 for all and for children (p=0.0081)


Incidence for children
Incidence/1000 person days
8
7
6
5
4
3
2
1
0
Jan
Feb
Mar
Apr
Month

…And then, what happened??

Congress in the US did not come across

- The communities believed that a COOP program was too expensive for them and decided to work as an association.
- Some communities understood that PRASA was a better alternative for them
- Communities, except for one that will not work with others, now meet with the partners for the good of all

We were are still working together

- Slow sand filter. MULAS
- The package plant-APEADERO
- Refurbish-La SOFIA

Partners that are still working together

NEW	Organization Name	Type of Organization	Aid to the partnershio
✓	PRWE Association (Small system sub-committee)	Professional organization (PR chapter of AWWA)	Technical assistance, construction services, engineering and technical services
✓	MERCK	Industry	$50,000 in funding for the construction of infrastructure in Mulas sector; this will provide the means to comply with the Mulas US EPA Administrative order and provide safe water for 250 households
✓	Gabriella and Paul Rosenbaum Foundation	Non-profit	Support of students and mentors working in the capacity development facets of the work plan of the partnership
	CECIA/IAUPR	Academic institution	Mentoring, education, coordination, capacity development and independence surveillance of the water quality
✓	US EPA (CEPD; NRMRL)	Federal Government	Donation of a package plant to be installed in Apeadero sector serving 70 houses; two uv systems and engineering services to improve La Sofia and Apeadero
	10 sectors in the communities (Mulas Jagual; Mulas La Sofia, Quebrada Arriba; Mamey; Muñoz Rivera; El Real; Marin; Apeadero (CAP); Apeadero (non CAP); Barros Betancourt	"The communities"	Creation of two separated community groups to improve the systems (Mulas sector committee and Apeadero sector committees); implementation of community base strategies; funding for improvements
	CAP	Non-profit COOP	Creation of two separated community groups to improve the systems (Mulas sector committee and Apeadero sector committee; cohesion between the sectors and community members; implementation of community base strategies; funding for improvements
✓	East Anglia University	Foreign Academic Institution	Independent surveillance research to document changes in health due to actions of the collaboration
✓	The Cryptosporidium Reference Unit; Department of Health of the UK	Foreign Country Government	Independent surveillance research to document changes in health due to actions of the collaboration
✓	Department of Education of PR	Local government	Meeting location, provide meeting space
✓	Puerto Rico Water and Sewer Authority (PRASA)	Local government	Evaluation of problems; endorsement of projects and centers for practice of the volunteer community operators
✓	US EPA Region II DESA	Federal Government	Analysis of samples for detection of hazards such as heavy metals in the water or soil affecting the source water of the PWS
	IAUPR Guayama Campus	Academic institution	Students mentoring community members in the identification of focci of contamination in the community sectors
✓	Pedro Lorenzo & Assoc. CHEROX and other Private Consultants (Sergio)	Consultants	Donation of time to prepared and submit permit applications necessary for some of the improvements developed by the collaboration; design and construction
✓	Shaw Environmental	Consultant	Technical support for US EPA NERL Lab donations
✓	H_2O	NGO non profit	Monetary donations to purchase chemicals for treatment
✓	Municipal Government of Patillas	Local Government	Preparation of construction area for the slow sand filter in Mulas
✓	Department of Health (Environmental Health Division)	Local Government	Laboratory services to determine the prevalence of parasitic illness in the members of the community


05.17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NON PRASA
PROHIBIDO EL PASO A
PERSONAL NO AUTORIZADO
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